

The Art of Gardening

Andrea X. Kong

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Permaculture: The Art Of Gardening

The Ultimate Ecological Design And Engineering Guide

By: Andrea X. Kong

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Dedication

This book is dedicated to my strongest source of support, my parents.

Chapter 1- Permaculture- A Brief History

Permaculture can be thought of both as a concept and as a copyrighted term or perhaps a trademark. The concept is certainly not new. In pre-Columbian times much of both North and South America was in carefully managed forest agriculture communities with virtually all aspects of life designed to foster a sustainable lifestyle.



Until the growth of feudalism parts of Europe practiced sustainable lifestyles. Similar practices existed in Sri Lanka and Tanzania. By the 19th Century many American philosophers and religious teachers were advocating sustainable lifestyles. In the desert regions of the Middle East and Africa houses have long been built to utilize solar energy to

power ventilation for cooling and store heat for night time heating.

In 1929 Joseph Russell Smith used the term Permanent Agriculture in the subtitle for his book *Tree Crops: A Permanent Agriculture*. By the early 1970's Bill Mollison and his student David Holmgren began publishing books and chapters on what they called permaculture. At this time Mollison claimed copyright on the term. Eventually it was realized that the term could not legally be copyrighted. Attempts to trademark or service mark the term has also failed. This development allows more people to use the term. Although this can benefit by allowing wider input into the movement, it also makes it possible for right wing opponents of ecological interests to use the term for concepts designed to profit from destroying the environment.

The influence of Holmgren on the work of Mollison is important because of his interest in design, particularly landscape design. In the early 1970s the two of them collaborated to develop an interdisciplinary earth science. At this time Holmgren was studying environmental design at Tasmania's Environmental Design School and Mollison was teaching environmental Philosophy.

Tasmania is a place where the modern world and nature collide. The intellectual ferment of the 1970s produced environmental movements all over the world at that time and the movement born in Tasmania flourished to produce Permaculture. Permaculture made its international appearance in 1976 through an article in Tasmania's *Organic Farmer and Gardener* newsletter in an article by Mollison and Holmgren titled *A Permaculture System for Southern Australian Conditions*.

Max Lindegger read the chapter and started the second permaculture group at his home in Queensland in 1976 and went on to found the first permaculture Eco village, Crystal Waters. Max described this as "an electrifying time".

The first book on the subject, *Permaculture One -a Perennial Agriculture for Human Settlements*, co-authored by Mollison and Holmgren was published in 1978 The first permaculture magazine also appeared that year. It was simply titled *Permaculture*.

This was a time that was ripe for virtually any ecological movement. The time of cheap energy derived from fossil fuels was beginning to end and concerns about the greenhouse effect were

beginning to be expressed by intelligent people. Concerns about the wholesale use of toxic chemicals had been around for some time and continued to grow.

In 1987 the publication of the Permaculture magazine was handed over to Robyn Francs and was moved to Sydney. It became known as the Permaculture International Journal. In 1986 the second international conference on Permaculture was held in Washington State in the United States, proof that the movement had become international.

The movement had taken hold in many countries by the turn of the century. Although it has become influential in many countries one of the most interesting places it has become influential is Ireland, a country that understands all too well the foolishness of monoculture of non-native crops. It is interesting to note that the Irish group emphasizes that Ireland once had many forest based farms and villages. Much of the agricultural model for permaculture is based on the forest gardening concept.

The Permaculture movement continues to be strong in America. As long as it is willing to grow in its intellectual model and does not fall into the trap of being dogmatic about any one interpretation of the basic concept it will continue to be influential. Because the initial work by Mollison and Holmgren laid out a specific formula in the form of enunciated principals it would be easy for dogmatic followers to fall into that trap. Hopefully the fact that the early movement was so open to debate and the ability to adapt to different situations will allow it to continue to grow.

One of the leaders of the permaculture movement in Australia is Rosemary Morrow. She has been quoted as saying that she views permaculture today as being a prototype. She points out that the movement is barely 30 years old. Other commentators remember that the principles are much older. The movement operating under the name Permaculture is based upon a formalization of related concepts into a particular intellectual discipline. By emphasizing that it is possible to combine a variety of lifestyle principles to further the goal of the long term survival of the Human race in a healthy and comfortable way it may be possible for people to realize that goal.

It is interesting to note that Holmgren has laid out twelve principles for Permaculture. Alcoholics Anonymous has a twelve step program for recovering alcoholics to follow. More than one environmentalist has

compared the dependence on non-renewable resources such as petroleum to drug addiction.

The future of the general green movement does not depend on the success of any one group in the movement, but as one or the other group grows in influence if it keeps in mind that the goal is the survival of mankind and not the survival of any one organization success for the movement is likely. Permaculture seems to understand that. The basic ethical principles of Permaculture are in line with that concept.

Chapter 2- The Benefits of Permaculture

Permaculture as a farming practice has been widely adopted by many farmers across the world. The practice applies the principles of agro-ecology in order to maximize the food production while effectively utilizing the limited resources. It also aims to create sustainability of the people and enriching their lives. It tries to correct the environmental problems brought about by industrialization.

The following are the numerous benefits associated with permaculture that has made it gain popularity in farming including:

Reduction in Cost of Agricultural Inputs

The cost of purchasing agricultural inputs like seeds and fertilizers is greatly reduced by permaculture. This is because the practice encourages the use of organic compost manure and animal manure. Wastes are gathered together and composted into organic manure which is then used as the crop fertilizer. Animal manure can be easily collected from the animals in the farm. This helps in saving the farmers the money which they can then use for other important things.

Optimal Utilization of Resources

By considering the natural ecosystem, permaculture practices are designed towards maximum utilization of the available resources for the optimal production of food. By doing this, the amount of waste materials is relatively reduced from the environment. Furthermore, any waste that is available is recycled back into compost manure which is useful as a cheap fertilizer.

Non-Chemical Agricultural Inputs

Permaculture discourages the use of chemicals in farming. As opposed to conventional practices where chemicals like herbicides and pesticides are used to prevent and control agricultural diseases, it encourages biological means of dealing with the problems. The principle of permaculture is based on the fact that natural predators can do the same functions as the chemicals, and even perform better. The produce is therefore chemical-free, and healthy for the body.

Reduction in Pollution and Creation of a Green World

Since permaculture is based on using natural resources and natural agricultural processes, there is little chance, if any, of pollution. This is because it encourages the use of non-chemical inputs, mulch and organic fertilizers that do not have any pollution impacts. This furthermore builds and promotes a green world which has a long term benefit to the world environment.

Agro-Biodiversity and Food Sufficiency

With such a farming practice, farmers are able to grow a diverse range of products in their farm lands through intercropping and reap huge produce and harvests. The food production is always high and enough to sustain the given farmers for a very long time. The practice also lays out extensive and safe ways of storing any surplus production for future use. This means one can sustain himself for many years even without farming.

Permaculture also enhances agro-biodiversity by encouraging farmers to plant trees alongside their agricultural activities. The trees are beneficial in that they provide shade for the plants, freshen the surrounding air, source of natural beauty, safeguard surrounding buildings from windstorms and are also an investment for the future generations. The diversity is also a plus to health since families can effectively improve and balance their diet, minimizing cases of nutritional diseases.

Income Generation and Diversification

The production surplus can easily be sold in the ready markets to generate valuable income to the farmer. This will help him in fulfilling his family's financial obligations. The crop diversity also diversifies the sources of income for the farmer, ensuring improved and reliable income. The cost of purchasing food is also nearly eliminated since the farmer eats his own food, saving sums of money in a month or year which can be directed into other important projects.

Garden Self-Sustenance

The cost of maintaining a permaculture garden is greatly reduced since the gardens are always designed in such a way that it is easy to use and can practically sustain itself. It requires less labor input from the farmer. The various natural gardening approaches ensure it remains productive even with little maintenance.

Helps In Soil and Water Conservation

This farming practice helps largely in soil conservation efforts, hence improving the soil fertility. The various practices of using organic and compost manure, mulching, nitrogen-fixing plants like legumes, intercropping, non-tilling practices, perennial crop planting and other conservation practices basically replenish the soils nutrients, ensuring soil conservation and fertility maintenance.

This will have a long run effect of land sustainability for future improved productions. In conserving water, the practice encourages full utilization of the available water. Rain water, which is nutrient-rich, is optimally harvested and utilized during the rain seasons. Most of the water is stored in well-conserved fertile soils that have good drainage. Other alternatives for conserving water include mulching practices and using reused and recycled water for irrigation in the gardens.

Helpful In Keeping Up with the Climate Change

Since the development of industrialization, the effects of global warming have drastically increased due to the harmful emissions and into the atmosphere from these industries. This has had an impact in climate change, generally changing the climatic conditions of the world; with its effect on agriculture clearly showing. Permaculture tends to apply approaches that are friendly to the natural ecosystem, creating an environment that is sustainable for the future. The farming practices look to maximize agricultural production through holistic, self-sustaining and environmentally-friendly procedures.

Even with the several benefits, permaculture still seems to be a strange philosophy for some farmers due to lack of training and penetration. The practice is basically an improvement of the traditional models of farming, looking to create an ethical environmental system.

Chapter 3- The Principles and Ethics of Permaculture

The principles and ethics of Permaculture is found in most traditional societies. There are three ethics which are earth care, fair share and people share. Cultural mechanisms of ethics that guide our self interest help us to have an understanding on good or bad results. The more power people seem to have, the more important it is to find ways to have a continuous biological and even cultural survival. Permaculture studies cultures that exist in balance with their environment. This is done so that we can look at ideas and values outside the norm that can help us have a sustainable future.

Earth Care looks at the status of the soil. If the soil is healthy this represents the health and well being of a society. The best way to know if the soil is good is to see how much life exists around it. All life has their purpose on earth. This is why it is important to respect all life. Even the ones that don't seem to have a purpose for some, but the part they play in the circle of life is just as vital and important as those that play a big part in it. We need to learn to reduce things that we consume that only work to hurt the environment. If one chain is broken in the circle of life, then the rest will follow and fall. We need to strengthen that chain and take good care of our environment.

People Care is focused on our families, our neighbors, ourselves and of course our communities. We as a people need to grow. The way we do this is in taking personal responsibilities and being self reliant. The way we succeed in this on things that really matter and not materialistic things that do not help us grow in any way, shape or form. We also have to look at things that we consume that only hurts our bodies. Just like the earth, what we put in it of a good or bad outcome. The key to personal care is to take responsibilities for our own actions.



We need to stop blaming others and empower ourselves by facing the truth and doing something positive about it. As a people we need to be aware that we need each other. Working together to take care of our families' neighbors and communities can have a great outcome for all. The goal of the permaculture is to focus on the positive, instead of the negative; after all being positive even in the worst circumstances will bring about a good result.

After you harvest the food, it is vital to take the time to pick the food. Then you have to share it and preserve what you have. A limit has to be put on how much food we can use. This is the importance of sharing what you have. At the rate we consume food and the rapidness with which many species are becoming extinct make it hard for us to continually grow. There are times when difficult decisions have to be made for the preservation of mankind and other species. We need to decide what best for us and motivate others to do the same. There is that old saying that children learn from what actions we ourselves take not by what we tell them to do.

There are many ways we can re-use things because of the type of society we and find ourselves in. It is not just the things that break that we should recycle; we need to learn to reuse what we can. We can't think of it as being cheap, we have to see it as finding useful ways to preserve our world. The more we take care of the earth, the longer we get to exist.

There are twelve permaculture principles that seem to be universal. The methods used in various place tend to vary from place to place and depending on the situation. These principles are relevant to our economic, social, personal and even our political lives. The principle in the permaculture opens up our minds to different ways of thinking. There are many different levels of depth that can be applied to our actions and decisions.

One of the principles is observing and interacting. If we take the time to get involve and learn from nature, we are able to find solutions that are practical for a certain situation. The second principle is storing energy. We can create systems that will store an abundant amount of resources and only used them in desperate times. We need to make sure that we are getting rewards that are of use from the work that we do.

Another part of the principle is self regulation. Inappropriate activity needs to be addressed in order for the principles to work well with each other. We need to make the best of renewable resources and services. There needs to be a way to reduce our dependence on things that don't help the environment or our bodies. It is important that we don't waster resources. An observation of nature and society has to take place to have a design in place. We have to be mindful in how we put things together. Find small solutions first to then slowly get to the bigger ones. We will have a better outcome in doing so. It's important to be creative when responding to everyday changes.

Chapter 4- The Zones of Permaculture

Outlined

Permaculture is a new method of agriculture that promotes sustainability. Where traditional agriculture focused principally on the growing of mono-crops (often soybeans, corn and wheat) – the precepts of permaculture value diversity in the species on a single farm, ranging from annuals to fruit trees and untamed wilderness, all on a single plot of land.

Permaculture's edicts promote an outlook that mimics an ecosystem, and relies on the idea that interspecies relationships between flora and fauna create sustainable areas that produce food while nourishing the environment. Instead of depleting soil, permaculture attempts to nourish it.

Imagine a tract of land that is specifically designed to support livestock and grow healthy crops while replenishing minerals necessary to support life. If executed correctly, the practice of permaculture engages these ideals. One of the precepts of permaculture that supports this ideal is the method of zoning a tract of land for different types of crops. By zoning an area based on a species' need for care, the land can be effectively managed for maximum yield. Rather than haphazardly planting crops, zoning creates a natural schedule for maintenance of the land by conserving resources and labor.

Zoning is applicable in any instance of permaculture, and can be scaled according to the climate and the individual topography of the land. Generally, permaculture is zoned from 0 to 5 and designated as a series of rings nesting inside one another. This particular construction of rings, though, is not necessary, though it does provide a good guide for a newcomer to this method of crop growing. By zoning according to a crop's needs, the grower can conserve water and use the outputs of each individual species to the advantage of the rest of the plants in the area.

Zone 0

Zone is usually the house or dwelling on the land around which the permaculture design is planned. Zone 0 essentially serves as the starting point from which the person who tends the land begins the

schedule of care.

Zone 1

Zone 1 is considered the area of the permaculture design that requires daily care. This area can include small livestock like chickens. As chickens require feeding and need to be let in and out of their coops, it would be best to place them somewhere within Zone 1.

Other constituents of Zone 1 can include annual and perennial herbs and flowers that the grower might want to frequently access. Herbs, for example, are often found in Zone 1 because they are picked right before use. Ornamental plants, like those appreciated for their blooms may also be located in Zone 1 to provide a pleasant view from the vantage point of the dwelling. Vegetables that need to be harvested continually throughout a season, such as tomatoes and peppers, may also be most useful planted in Zone 1. Kitchen scrap compost piles are also located in Zone 1 where they are easily tended to by the keeper of the grounds.

While Zone 1 is often planted in a circle around the dwelling, Zone 1 plants and animals may also be located along easily accessible paths that fan out from Zone 1.

Zone 2

Zone 2 should include hardy perennials and herbs and roots that are less frequently harvested such as ginger. Crops that provide a single annual harvest and have a longer period of maturation, such as corn and potatoes, should also be planted in Zone 2. Thus, Zone 2 plants do require attention, but can generally be left alone for several days at a time without damage or concern.

It is important to note too that both Zone 1 and Zone 2 are usually mulched to control weeds and irrigated to support more delicate plants.

Zone 3

The inner edge of Zone 3 generally consists of sprawling vegetables, fruits and berries. Think pumpkin, watermelon and blackberries. These plants are capable of being left alone for longer periods of time and are prolific growers such that they may strangle other more orderly plants in Zones 1 and 2. These plants require plenty of room, need to be harvested at specific times of the year and

require less irrigation. And because of their ability to grow out and sprawl, they need less weeding to prevent competition. Thus, the inside of Zone 3 only needs periodic maintenance and care.

Larger compost piles can also be placed in Zone 3. When the Zone 1 compost pile is full, one may transport the composting material to Zone 3. Alternatively, the Zone 3 compost pile can be largely constituted of green waste, such as weeds, leaves and plant trimmings.

Bees are good residents in Zone 3 where they have access to many flowering plants but are also placed safely away from regular human contact.

Also found in Zone 3 are fruit and nut trees. In essence, the outside perimeter of Zone 3 can act as a fruit orchard. The trees require less attention, and if not harvested no particular harm is done to the ground below. In fact, fallen fruit can be left to decompose and nourish the soil or to feed wildlife.

Zone 4

Zone 4 is barely managed, and is a good place for growing wild edibles or keeping grassy pasture for larger livestock. This zone primarily takes care of itself and requires little care.

Zone 5

Zone 5 is an unmanaged area of bush or forest. It provides haven for animals, and allows the land to grow native species. Zone 5 keeps the soil healthy and promotes the proliferation of indigenous flora and fauna.

This is a simple rubric for designing a permaculture area. Urban areas using the principals of permaculture may only have Zones 0 through 3. Larger areas, such as previous farmland, may have all five zones in use. In either instance, however, the methods and principles of permaculture respect the environment while yielding abundant and diverse harvests to the caretaker of the land.

Chapter 5- Is Permaculture Really Sustainable?

Permaculture has been a popular topic for quite some time now. We all dream of living in ecologically friendly cities, with enough food and green energy, we all would thrive well in a society centered on having a green environment and clean water. All this is what Permaculture preaches, but is it sustainable in the long run? Can the already filled cities create any new gardens for growth of food? Whether or not all the items on the list can be achieved is the question. The system is well thought out and is an ambitious project but is it sustainable?

The argument will definitely go on for a while. While there is already agro-forestry and hugelkultur to show the progress that has been made, it is just a drop in the bucket. Hugelkultur is a good practice and if it can be achieved, it would be a big advancement but the question is where that kind of wood will come from in order to store just enough water to sustain a few acres of land. It is much more of a dream than a reality because the implementation can only be achieved on a fraction of land.

About agro-forestry, the question marks lie over the productivity of forests in comparison to farmland. Since the productivity of forests over time generally depreciates due to ecological succession, which is more important...The trees or the crops? Whether the argument is between woodland forest and climax vegetation, it still remains largely unconvincing to practice the farming method. Scientifically, productivity of woodland rises only until the woodland stage and then declines steadily thereafter which causes reason to hesitate.

The case for application of permaculture to natural buildings is also one to think about. The science demands that focus has to shift to use of material that is minimally processed at worst but encourages the application of renewable resources or those that can be recycled only; material that are largely unavailable.

Using purely salvaged material for buildings would be almost impossible and successfully completing whole construction purely on human labor looks a past thing and is almost impractical. Also orienting buildings to climate remains largely untested except for those

who have enough monies to splash. In reality after one completes a building following the tenets of Permaculture, the costs and net input would be double what it could ever cost without Permaculture.

Water harvesting is arguably the most achievable of the options outlined so far but is also still farfetched. Rainwater is easiest within the bracket again but when you come to others such as black water and grey water, their uses are only a selected few even after they are harvested. Sheet mulching is also quite practical and easily applicable.

To determine the sustainability of Permaculture therefore, it's worth looking at the principles that guide the science. Twelve guidelines are outlined below:

1. Respond to and be creative with change-That for the slightest change that we observe, we have to be creative with it and respond to it. At times change is inevitable but the principle encourages us that if we pay close attention to what happens around us, we can always have a chance to intervene. Can we time the changes and make observations?
2. Make use of diversity- diversity is what keeps everything in balance. It reduces vulnerability because events and occurrences end up, canceling each other out. This reduces threats to nature which is just what we need. Is it sustainable though?
3. That we have to observe and interact with nature- nature is the greatest thing that ever happened, so phenomenal! But then understanding nature is never a one day activity, it has to be a daily experience and we are asked to be appreciative of it.
4. Can we aim to produce no waste? - This is of course a strange one but it is what Permaculture asks of us.
5. Making use of the most diverse of elements in Permaculture - the margins. The interface between things or events is said to be the most valuable instrument that one can hope to get from any situation.
6. Designing from patters to details - first it has to be about taking one step back and making observations on nature and then building from the observations made. What we see happening should always form the basis of any future designs.

7. Major in integration and minor on segregation- putting things together is the way to go with Permaculture. Once things are integrated, they find always to support one another as they develop relationships in these interactions. Is this feasible?
8. Can we be self regulative so that we avoid what is deemed inappropriate and focus only on what is perceived as right? Every feedback has to be respected too.
9. An obtaining g yield is part of the game too. If one is not seeing any viable yields from whatever is done then that's against Permaculture.
10. Tapping energy and storing it is the other thing. Such energy collected during time of plenty can be used during the times of scarce.
11. Taking care of and valuing renewable resources-for sources that are renewable are the best to rely on as compared to non renewable sources.
12. Lastly, small and slow developments are the best way to go because small portions are easier maintained and are much more sustainable than big hasty programs. With the current trends is this viable?

To answer the question therefore one has to analyze the initial applications listed and see if they are in anyway applicable with the principles that are outlined. It does not look so much out of the ordinary yes, but is Permaculture really sustainable? Well, it could be a little too early to say the answer is a straight NO but then I don't think it yet qualifies for a YES too.

Chapter 6- How to Get Started In Permaculture

If you have been to the grocery store lately you know that the cost of food has nearly doubled on produce and other organic necessities. Not only have grocery prices escalated, electricity, gas and several other things have skyrocketed as well. With all these price increases, families are concerned about how to be more self-sufficient and less reliant on suppliers. In return, many are reverting to old methods of living by growing their own produce and living off the land. This lifestyle is called Permaculture and the people are switching to this lifestyle in overwhelming numbers.

Permaculture is so much more than just cost cutting methods, it is a whole lifestyle change based on living naturally or “green” and creating a better environment. When a person decides to make this lifestyle change, there are many things that they can do. The best thing is to start out slowly and make minor changes first. A great place to start is by collecting rainwater.

Using water from the tap is convenient but the monthly bill seems to be increasing for water that is laden with chemicals. Rainwater can be used for watering a garden or other foliage around the home. Some people even use rainwater for bathing and to wash their hair. It has been said that rainwater is amazing to wash hair with and gives locks an extra sheen.

Growing food is a hobby that most people enjoy. The previous two decades showed a drastic decrease in people growing their old food. However; the current decade has shown a growing interest in people that want to grow their own food and have healthier food consumption. When you grow your own food, you can control the chemicals that are used in the soil.

Oftentimes, farmers will fertilize and use special chemicals to help boost their crops and make their produce bigger and better when it goes to market. On the other hand, if you purchase organic items in the store it is extremely expensive. Even though the label may say organic, it is really hard to judge just how organic it is. Currently, there are no regulations over organic labeling and just because it says organic doesn't really mean anything except larger price tags.

Utility bills are a large expense a household has each month. Many people are going off the grid in an effort to save money and conserve energy. With inclement weather, there are many times that homes sit for days, or even weeks without electricity. By using solar energy, people can have electricity regardless of what the weather conditions are.

The great thing is that a solar setup can harvest energy from the sun which can be used in a home. It does cost a great deal of money to get started with this type of set-up, but the thought of reducing or eliminating a utility bill is worth the cost. Going off the grid is becoming increasingly more popular with those who want to live a permaculture lifestyle.

Building “green” homes is becoming increasingly more popular. The materials that are used inside these homes are all created using a different process than regular building materials. A “green” home would use solar energy. They would also minimize water usage and find creative ways to use less water. These homes would have a lot of plants inside to help bring oxygen into the space. These homes have toilets that use significantly less water and reduce overall energy costs through the use of heavy insulation. Even the paint that is used in these dwellings is organic and “green” and a completely safe alternative.

These homes tend to be built in communities with other like minded individuals. Also, realtors have a hard time finding people homes of this nature. Most homes are built using the most economic products but don't necessarily have “green” features in mind. While some may have a few elements that provide energy savings, they are nowhere near the caliber of a natural home.

Beautifying property by restoring diminished landscapes is another element of permaculture. Renewing and saving plants helps to renew oxygen into the air. By restoring a landscape that has been let go, it can help to prevent soil erosion. Making a home look beautiful is really just the beginning purpose of making the landscape thrive. Insects like honey bees depend on the pollen from flowers, and we depend on honey bees for delicious honey. It is a way to give back to nature and to allow butterflies, bees and even birds a chance to enjoy a magnificent flower garden.

Permaculture is about giving back to nature and in return allowing nature to give back to us. It requires us to reevaluate our current

lifestyle and to make changes for a better tomorrow. Recycling products, reusing trash to make organic compost and using rainwater is all great ways to get started. There are some many things that can be used to ensure our planet lasts a little bit longer.

It is our responsibility today to be caretakers for the earth for the next generation. We can do this by making simple changes in our daily lives and for some changing their whole lifestyle. By reducing our need for fossil fuels and reducing our carbon footprint, we can one step at a time change our world. If everybody would do their part, we can ensure a better tomorrow.

Chapter 7- Permaculture- Putting It All Together

Permaculture is a technique of agriculture designed to develop self-maintaining agricultural systems that are modeled after natural ecosystems. There are three main philosophies that permaculture systems abide by for their continual success. First, humans must care for the earth and allow for its agricultural systems to multiply and carry on.



Second, the permaculture system's resources must be accessible to all the people that it provides for to ensure their continued existence. Third, any surpluses or waste from the permaculture system must be reinvested back into the system to ensure that the first two philosophies are met.

The design of a permaculture system emphasizes disparate landscape patterns that aid to its overall function. Thus, the core concept behind permaculture is maximizing synergy between all of the components in the system. Permaculture designs therefore are devised to minimize human labor, waste, and the overall amount of energy input. Permaculture systems also have the capability to evolve

over time as new situations present themselves. Once all of these provisions are taken into account, a permaculture system can provide an abundance of resources with a minimal amount of input.

The underlying features of permaculture systems were first derived from systems ecology science as well as studies conducted on pre-industrial agricultural systems of sustainable land use. After combining numerous forms of agricultural philosophies, scientists have more-or-less agreed on twelve design principles underlying permaculture systems. One version goes like this:

Utilizing and recycling all waste products

Obtaining substantial yields

Constantly observing and interacting with the environment

Designing systems that reap and store resources at peak abundance

Using as many renewable resources as possible

Applying self-regulation and listening to feedback when necessary

Creatively evolving in response to environmental changes

Supporting a system of diversity to reduce vulnerability

Integrating the system to maximize synergy

Utilizing natural patterns in nature and society to design a system

Maintaining more small and slow systems rather than one large system

Valuing the areas where two separate eco-systems meet, because these can be the most productive areas.

The philosophy behind permaculture patterns is to mimic naturally occurring patterns in order to maximize products. Certain patterns such as spirals, waves, nets, honeycombs and branching are all frequently occurring patterns in nature.

Permaculture has a philosophy of layers that benefits the overall

system and the humans using it. Natural ecosystems build on layers and have been studied extensively by plant and soil scientists. Diverse cultures of life are able to flourish in natural ecosystems by utilizing all every nook and cranny possible. Layers can be stacked right upon each other and there are seven recognized layers that have been distinguished by scientists and practitioners:

The canopy is the highest level, usually dominated by large trees.

The understory layer is where trees of 45 feet or less reside.

Shrubs come next, which include numerous types of bushes.

The herbaceous layer consists of many forms of annuals, biennials and perennials.

At the ground level is the soil layer, which is comprised of decaying organic matter, cover crops, nutrients and manures.

The rhizosphere layer is where many roots and root crops reside.

The vertical layers are where many vine varieties dwell.

Another aspect of permaculture systems are guilds. A guild is a particular region within a system where diverse plants are selectively planted to work in symbiosis. Guilds can even include species of insects and animals that work well with the types of plants being cultivated. Obtaining all the information to form a properly working guild can take time, but once it has been accomplished a guild can work as a self-sustaining entity.

Pertaining to the 12 provisions of permaculture, the edge effect can be one of the most productive areas in a permaculture. The edge effect engendered by placing disparate environments side-by-side in a particular ecosystem. When two vastly different environments meet, there is an effect of intense productivity. For example, some permaculturists will place woodland environments next to open areas, because the edges between the two environments are said to be the most productive out of any other contrasting environments.

Finally, permacultures utilize a technique referred to as zones. Zones are used to organize agricultural environments in such a way that they accommodate the needs of the humans, plants and animals included. Essentially, zones are about appropriately positioning

disparate environments according to how much the environment is used or harvested from. There are 6 different zones that have been distinguished starting with zone 0.

As mentioned beforehand Zone 0 is where the home is located. This is where principles of reducing energy usage and harnessing renewable resources take place. Zone 1 is the zone closest to the home. The environment in this zone contains many plants that need frequent attention, so keeping them close to the home can raise efficiency and cut costs. Zone 2 is for plants that require less frequent attention than zone one plants, but will still need pruning and weed control every now and then. Zone 3 is where the main cash-crops are grown. Watering and weed control are only required about once a week for crops in this zone. Zone 4 is designated as a semi-wild area where wild foods can be collected. This area is mainly used for forage and timber production. Last, but not least, zone 5 is categorized as the wilderness area. No human intervention is required in this zone, but it can be used to observe the natural process of ecosystems.

Furthermore, permaculture can be described as using observations of natural ecosystems to serve as a template as to how human beings should go about agriculture. It is of utmost importance for human beings to use this knowledge to create sustainable agricultural systems that have little to no negative impacts on the earth, otherwise we may lose the ability to live in harmony with the earth altogether.

About The Author

Andrea X. Kong is not a stranger to any form of sustainable living as she grew up in a very conservative home in which her parents practiced some of the tenets of sustainable farming. When she grew up she opted to remain on the property her parents had and continued to live that lifestyle, only staying in the city on occasion for work.

She had a keen interest in finding even more ways to maintain this sort of living and ended up coming across permaculture. Curiosity got the better of her and she simply had to get more research done to find out as much as she could about it. To her it seemed like an extreme form of sustainable living but some of the tenets actually made sense to her. As a result of this she made the decision to adopt some of the principles into her and her family's lifestyle.